WETLAND MITIGATION SITE MONITORING REPORT
FAP 316 (IL 26), near Orangeville in Stephenson County, 2003

INTRODUCTION

This report details monitoring of the wetland mitigation site created to compensate for wetland loss and disturbance caused by the relocation of Illinois Route 26 near Orangeville in Stephenson County. The compensation site consists of approximately 3.4 ha (8.5 acres) of wetland creation (Site 1) and 3.3 ha (8.2 acres) of wetland enhancement (Site 2). The wetland creation is located north of the former West St. James Road, west of the Jane Addams bike trail (former railroad right-of-way), and east of the realigned Illinois Route 26 (legal location S/2, SW/4, Sect. 36, T 29 N, R 7 E). The wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26 (legal location E/2, NW/4, Sect. 1, T 28 N, R 7 E). Emergent wetland vegetation was planted at Site 1 on 28 July 2000. A seeding mixture was planted at Site 2, and around the perimeter of Site 1, in late August 2000. On-site monitoring was conducted on 26 September 2000 (Matthews et al. 2000), 22 and 23 August 2001 (Matthews et al. 2002a), 12 and 13 August 2002 (Matthews et al. 2002b), 18 and 19 August 2003, and 9 and 10 September 2004.

This report discusses the goals, objectives, and performance criteria for the mitigation project, the methods used for monitoring the site, the monitoring results from September 2004 (the fifth year of site monitoring) and a discussion and recommendations based on those results. Methods and results are discussed by performance criteria for each goal.

Goals, Objectives, and Performance Standards

Goals, objectives, and performance standards follow those specified in the wetland compensation plan that the IDOT Wetlands Unit developed for this site. Each goal should be attained by the end of the 5-year monitoring period. Goals, objectives, and performance criteria are listed below.

Project goal 1: The created and enhanced wetland communities should be jurisdictional wetlands as defined by current federal standards.

Objective: The created wetland should compensate for the loss of 1.82 ha (4.5 acres) of emergent wetland and 0.08 ha (0.2 acres) of farmed wetland at a 1.8:1 ratio (8.5 acres of compensation). The enhanced wetland should compensate for an additional 1.32 ha (3.25 acres) at a 2.5:1 ratio (8.1 acres of compensation), which may be required by the recent Draft of Wetlands Administrative Rules (IDOT Wetlands Unit, Wetland Compensation Plan).

Performance criteria:

a. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.

b. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft), or have soils that are saturated to the surface, for at least 12.5% of the growing season.

c. Occurrence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.

Project goal 2: The created wetland plant community should meet a standard for vegetation cover.

Objectives: An emergent marsh will be created, and a wet meadow will be enhanced, by planting native wetland vegetation.

Performance criterion: Planted vegetation should account for at least 50% of the ground cover at each of the sites.

METHODS

Project goal 1

a. Predominance of hydrophytic vegetation

The method for determining dominant vegetation at a wetland site is described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). The relative Importance Value, a combination of relative coverage and relative frequency, of each species was determined by quantitatively sampling vegetation at each site (see project goal 2, below). Species were then arranged by Importance Value in decreasing order, and Importance Values were sequentially summed, starting with the most prevalent species, until the total reached 50. Those species included in the summation were considered dominant species. Each of the dominant plant species was then assigned its wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter (*i.e.*, FAC, FAC+, FACW, or OBL) is considered a hydrophyte. A predominance of vegetation in the wetland plant community exists if more than 50% of the dominant species present are hydrophytic.

b. Presence of wetland hydrology

In April 2001, Illinois State Geological Survey (ISGS) personnel installed nine soil-zone monitoring wells, three stage gauges, a rain gauge, a sonic water-level data logger, and an RDS water-level data logger (Weaver and Carr 2001). In 2002, ISGS personnel installed additional monitoring wells, stage gauges, and water-level data loggers and produced topographic maps of the site. Locations for these instruments can be found in the ISGS report *Orangeville Wetland Compensation Site* (Weaver and Carr 2004). Methods are further described in the ISGS document *Annual report for active wetland compensation and hydrologic monitoring sites* (Fucciolo et al. 2004).

c. Occurrence of hydric soils

The soil was sampled in order to monitor hydric soil development. Soil profile morphology, including horizon color, texture, and structure, was described at various points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were noted.

Hydric soils typically develop slowly, and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at the end of the five-year monitoring period, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation persist at the site.

Project goal 2

Vegetation at the wetland enhancement and created wetland was quantitatively sampled using 0.5-m x 0.5-m (0.25 m^2) quadrats placed every 30.5 m (100 ft) along transects. For the created marsh, the emergent zone was sampled separately from the higher elevation wet prairie border. Nine parallel transects placed every 30.5 m (100 ft) and running east to west were used to sample the emergent marsh zone, and a single transect running along the perimeter of the created wetland was used to sample the wet prairie border zone. Fifteen parallel transects placed every 30.5 m (100 ft) and running southeast to northwest were used to sample the wetland enhancement site. All plant species in each quadrat were recorded and each species was assigned a cover class (Table 1), an estimate of the amount of area within the sample quadrat that is covered by that species. Data from quadrats were used to calculate frequency (percent of quadrats in which the species is present), relative frequency (frequency relative to other species), average cover per quadrat, relative cover, and Importance Value (average of relative frequency and relative cover) for each sampled species. Trees planted around the borders of both sites were censused to assess their survival.

Table 1: Cover classes used to estimate aerial cover by plant species in sample quadrats

Cover class	Range of aerial cover	Midpoint of range
r	<1%, solitary	0%
+	<1%, seldom	0%
1	1-5%	3%
2	5-25%	15%
3	25-50%	37.5%
4	50-75%	62.5%
5	75-95%	85%
6	95-100%	97.5%

Floristic quality assessment

The Floristic Quality Assessment (Taft et al. 1997) was applied to the plant community at each site to evaluate ecological integrity. The assessment methodology is used to identify natural areas and facilitate floristic comparisons among sites. This technique is part of the procedure for the long-term monitoring of natural areas and the monitoring of restored or created wetlands (Swink and Wilhelm 1994). Plant species not native to

Illinois are not included in the FQI. Each native plant species is assigned a coefficient of conservatism (*C*) ranging from 0 to 10. Lower numbers have been assigned to species that tend to be more tolerant of disturbance and higher numbers to species that are generally found in less disturbed natural areas. A mean coefficient value (m*C*v) is determined by summing the coefficients of conservatism (*C*) and dividing by the total number of native species (*N*). The Floristic Quality Index (FQI) is then determined by dividing the sum of the coefficients of conservatism by the square root of *N*. This calculation is done to incorporate numerical species diversity into the FQI value. Sites with FQI values less than 10 suggest that the area has been highly disturbed or is in an early successional stage. Sites with FQI values of 20 or more, and m*C*v of greater than 3.0, generally possess some evidence of natural character and may be considered environmental assets. Sites with FQI values of 35 or more are considered to be of natural area quality.

RESULTS

Project goal 1

a. Predominance of hydrophytic vegetation

Dominant plant species for the created marsh (Site 1A), the wet prairie border (Site 1B) surrounding the marsh, and the wetland enhancement (Site 2) are shown in Tables 2, 3, and 4, respectively. At each of the three sites, greater than 50% of the dominant species are rated OBL, FACW or FAC, and therefore, the dominant vegetation is hydrophytic.

Table 2. Dominant plant species by stratum and wetland indicator status for the created wetland (Site 1A)

Dominant plant species	Stratum	Indicator status
1. *Carex lacustris*	herb	OBL
2. *Leersia oryzoides*	herb	OBL
3. *Lemna minor*	herb	OBL
4. *Phalaris arundinacea*	herb	FACW+

Table 3. Dominant plant species by stratum and wetland indicator status for the wet prairie border of the created wetland (Site 1B)

Dominant plant species	Stratum	Indicator status
1. *Phalaris arundinacea*	herb	FACW+
2. *Rudbeckia subtomentosa*	herb	FACW
3. *Salix exigua*	shrub	OBL
4. *Salix nigra*	shrub	OBL
5. *Trifolium hybridum*	herb	FAC-

Table 4. Dominant plant species by stratum and wetland indicator status for the wetland enhancement (Site 2)

Dominant plant species	Stratum	Indicator status
1. *Agrostis alba*	herb	FACW
2. *Bidens vulgata*	herb	FACW
3. *Impatiens capensis*	herb	FACW
4. *Leersia oryzoides*	herb	OBL
5. *Phalaris arundinacea*	herb	FACW+
6. *Solidago gigantea*	herb	FACW

b. Presence of wetland hydrology

Hydrologic data for the sites for September 2003 through August 2004 are presented in Appendix B (Weaver and Carr 2004). An estimated 3.19 of 3.40 ha (7.88 of 8.50 ac) at Site 1, and an estimated 1.50 of 3.32 ha (3.71 of 8.20 ac) at Site 2 conclusively satisfied the wetland hydrology criterion during the monitoring period (Figs. 1-2).

c. Occurrence of hydric soils

Soils on both the wetland enhancement and the wetland creation were originally found to be disturbed. At both sites, soils were intentionally removed exposing a lower substratum. Since site construction, new pedogenic processes have taken place and soils are developing accordingly. Hydric features are developing throughout both sites.

The soils at the created marsh are more disturbed than soils at the wetland enhancement. This area may have been excavated as much as 1.5 to 1.8 m (5 to 6 ft). Soils are much sandier towards the creek inlet. Concretions were found in many of the pedons throughout the site. The following is a description of a typical pedon within the created marsh.

Table 5. Description of the soils at the created marsh (Site 1A)

Depth (in)	**Matrix Color**	**Concentrations**	**Depletions**	**Texture**	**Structure**
0 – 6	10YR 2/1			Silt Loam	Granular
6 – 35	10YR 5/6 & 2.5Y 5/2	N2.5/0 N2.5/0 concretions		Silty Clay Loam	Sub-Blocky
35 – 45	5BG 4/1			Sandy Clay to Clay	Massive

The soils at the wet prairie border of the created wetland (Site 1B) are also disturbed. The soils here have not been excavated as deeply as the adjacent lower area. Although this area is slightly higher, the soil does show prominent hydric features. Concretions were found in many of the pedons throughout the site. The following is a description of a typical pedon within the wet prairie border of the created marsh.

Table 6. Description of the soils at the border of the created marsh (Site 1B)

Depth (in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0 – 2	10YR 2/1			Silt Loam	Granular
2 - 21	10YR 2/1	5YR 3/4 & 7.5YR 3/4		Silt Loam	Granular
21 – 27	10YR 2/1	5YR 3/4		Silty Clay Loam	Sub-Blocky
27 – 34	10YR 5/2	7.5YR 5/8	5BG 5/1	Clay to Sandy Clay	Massive

At the wetland enhancement (Site 2) the soils were excavated perhaps only 0.3 to 0.45 m (2 to 2.5 ft). No other type of anthropogenic disturbance is evident within the profile. A buried A horizon was found at 0.6 m (23 in). Even though the soil is disturbed, hydric soil indicators are distinctly present. A typical pedon is described below.

Table 7. Description of the soils at the enhanced wetland (Site 2)

Depth (in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0 – 3	10YR 2/1			Silt Loam	Granular
3 – 20	10YR 2/1	10YR 3/4		Clay Loam	Sub-Blocky
20 – 28	10YR 2.5/1	10YR 3/4 2.5YR 3/6 concretions		Silty Clay Loam	Massive
28 – 40	N 2.5.0			Silty Clay Loam	Granular
40 – 50	10YR 2/1			Silt Loam to Silty Clay Loam	Sub-Blocky

Project goal 2

The results of quantitative vegetation sampling for the emergent marsh zone of the created wetland, the wet prairie border of the created wetland, and the wetland enhancement are presented in Appendix C. In the emergent marsh zone of the created wetland ten planted wetland species were present in sampled quadrats. These species, combined, accounted for approximately 24.2% of the relative plant cover at the site, an amount similar to 2002 and 2003. *Carex lacustris* and *Alisma plantago-aquatica* were the most important planted species.

Nineteen planted species were present in quadrats in the wet prairie border of the created wetland. Together these nineteen species cover approximately 23.9% of the site. However, two of these species are not considered hydrophytic. Cover by planted species at the site is equivalent to cover in 2003, but in 2002, 49.9% of the plant cover at the site was made up by planted species.

Five planted wetland species were present in quadrats in the wetland enhancement: *Juncus torreyi, Carex vulpinoidea, Spartina pectinata, Scirpus atrovirens*, and *Leersia oryzoides*. Relative cover by planted wetland species increased from 10.3% in 2002 to 19.7% in 2003, mostly due to increased relative cover by *Leersia oryzoides*. In 2004, however, relative cover by planted species at this site was 13.1%.

All planted saplings on the southeast border of the wetland enhancement site have survived through the fifth year of monitoring. Five saplings (4.8% of those planted at the site) along the border of the created wetland did not survive the first growing season, but no additional saplings have died since then. Surviving saplings are listed by species in Table 8.

Table 8: Surviving saplings at the wetland enhancement and created marsh

Common name	Botanical name	Number at enhancement	Number at created marsh
Birch	*Betula japonica*	0	2
River birch	*Betula nigra*	0	8
Green ash	*Fraxinus pennsylvanica*	4	0
Eastern cottonwood	*Populus deltoides*	10	20
Swamp white oak	*Quercus bicolor*	10	50
Bur oak	*Quercus macrocarpa*	0	20

Photographs illustrating vegetation at both sites are presented in Appendix D.

Floristic Quality Assessment

Mean coefficient of conservatism and FQI values were calculated for each site from the species lists included in Appendix A. For each site, mCv and FQI values were calculated using only species that became established on the site naturally (volunteer species), and then recalculated to include planted species (Table 9).

Table 9: Mean coefficient of conservatism (mCv) and Floristic Quality Index (FQI) values for wetland creation and enhancement sites

	Planted species not included		Planted species included	
Site	mCv	FQI	mCv	FQI
1A. Created marsh	3.0	18.7	3.2	23.8
1B. Wet prairie border	2.0	11.5	3.3	28.4
2. Wetland enhancement	2.1	16.5	2.3	19.4

DISCUSSION

After four years of site development, these sites show good progress towards wetland establishment. Site 1, including both the created marsh (1A) and the wet prairie border (1B), has consistently satisfied the three criteria of a jurisdictional wetland: wetland hydrology, hydric soils and dominant hydrophytic vegetation. In 2002, the wet prairie border of the created marsh (Site 1B) did not support dominant hydrophytic vegetation (Matthews et al. 2002b). This was due, in part, to the establishment of several non-hydrophytic species that were planted at the site or along Illinois Route 26. In 2000, 2001, 2003, and 2004 however, Site 1B did support dominant hydrophytic vegetation. Because Site 1B is a narrow band around the periphery of the marsh, vegetation was sampled with a single transect. In 2002, this transect may have been at a slightly higher elevation than in other years.

The 2002, 2003, and 2004 estimated areal extent of wetland hydrology at Site 2 (Weaver and Carr 2002, 2003) decreased compared to the extent in 2001 (Figs. 1-2, Appendix B). Year-to-year fluctuations in extent of wetland hydrology are natural in wetlands. However, in 2001, less information was available on site topography and fewer wells were monitored on the site, suggesting that the data from 2002-2004 may be more informative than data from 2001. An estimated 45 to 57% of the site conclusively satisfied the wetland hydrology criterion from 2002 through 2004. Although Site 2 supports dominant hydrophytic vegetation, it is unlikely that the entire site will develop wetland hydrology without further manipulations to the site.

Soils at both sites were seriously disturbed during the wetland creation process. Even so, soils at both the wetland enhancement and the created wetland have developed hydric soil indicators and meet the jurisdictional hydric soil criterion.

Planted wetland vegetation has established fairly well at Site 1A, the created marsh. The plant community at the site is typical of a natural marsh. Relative cover by planted species at Site 1A has remained around 25% for the past three years. Although this does not satisfy the performance criterion for project goal 2 (i.e. that planted vegetation should account for at least 50% of the ground cover at each of the sites), it is fairly good for planted herbaceous vegetation coverage at a constructed wetland. The performance standard may be unrealistic and unachievable. Most of the species planted at the created marsh persist (14 of 19 planted species), and most are spreading from where they were originally planted. Coverage by planted species in the wet prairie border of the created marsh (Site 1B) decreased from almost 50% in 2002 to 20% in 2003, and 24% in 2004. However, many of the planted species present in the wet prairie border in 2002 were not considered hydrophytic. The difference in percent cover by planted species was probably due to a small difference in transect location between 2002 and 2003/2004. The wet prairie border supports several species characteristic of natural wet meadows and wet prairies. In 2004, 23 of the 37 reportedly planted herbaceous species were located in the wet prairie border, which can be considered a good rate of planted species establishment. Several additional conservative prairie species have established in the wet prairie border, and we assume that these species were planted at a higher elevation, along Route 26, and have spread to the site.

Planted vegetation at the wetland enhancement (Site 2) has not been as successful as planted vegetation in Site 1. Coverage by planted herbaceous vegetation at Site 2 increased from 0% in 2000, to 6.1% in 2001, to 10.3% in 2002, to 19.7% in 2003, but decreased to 13.1% in 2004. In 2004, we located surviving individuals of seven of the 17 reportedly planted species. This site was designed as an enhancement of an existing *Phalaris arundinacea*-dominated wet meadow. Currently *P. arundinacea*, an aggressive and undesirable species, accounts for 30% of the relative vegetation cover at the site, and is by far the most dominant species. Although overall plant species diversity has increased at the site as a result of enhancement activities, this result may be temporary. If *P. arundinacea* continues to spread, the site will not have resulted in an "enhancement" of the plant community at the site.

Phalaris arundinacea is also a dominant species at, and a major threat to, the continued success of, sites 1A and 1B. It has been a dominant species at site 1B since 2001, and greatly increased in importance at Site 1A between 2003 and 2004. In addition, willow shrubs (*Salix*

spp.) have invaded Sites 1B and 2, and are dominant species at Site 1B. A high level of cover by willows is inconsistent with the goal of creating herbaceous wetlands, and a prescribed burn may be beneficial for these areas (Illinois State Geological Survey personnel should be notified prior to a burn, so that any monitoring equipment can be removed).

Floristic Quality Index values at the created marsh, the wet prairie border of the marsh, and the wetland enhancement sites, when planted species are included, approach or exceed those indicative of high natural quality. These values increased from 2000 through 2003, but remained fairly constant between 2003 and 2004 (Matthews et al. 2000, 2002a, 2002b, 2003). Encroachment by *P. arundinacea* may lead to an eventual decrease in species diversity and FQI, and should be considered a threat to the long-term success of these wetlands.

This is the fifth annual monitoring report for this project area, and unless directed otherwise, it will be our final report for these sites.

Literature Cited

Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Technical Report Y-87-1.

Federal Interagency Committee for Wetland Delineation. 1989. Federal manual for identifying and delineating jurisdictional wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication.

Fucciolo, C. S., S. E. Benton, K. W. Carr, M. V. Miller, J. J. Miner, E. T. Plankell, G. E. Pociask, B. J. Robinson, G. A. Shofner, and K. D. Weaver. 2004. Annual report for active wetland compensation and hydrologic monitoring sites. Report submitted to the Illinois Department of Transportation, Bureau of Design and Environment, Wetlands Unit.

Matthews, J., J. Kurylo, P. Tessene, and D. Keene. 2000. Wetland mitigation site monitoring report: FAP 316 (IL 26) Stephenson County. Technical report submitted to the Illinois Department of Transportation, Bureau of Design and Environment.

Matthews, J., J. Kurylo, D. Busemeyer, and P. Tessene. 2002a. Wetland mitigation site monitoring report: FAP 316 (IL 26) Stephenson County, 2001. Technical report submitted to the Illinois Department of Transportation, Bureau of Design and Environment.

Matthews, J., J. Kurylo, P. Tessene, and M. A. Fiest. 2002b. Wetland mitigation site monitoring report: FAP 316 (IL 26), near Orangeville in Stephenson County, 2002. Technical report submitted to the Illinois Department of Transportation, Bureau of Design and Environment.

Matthews, J., J. Kurylo, P. Tessene, and B. Wilm. 2003. Wetland mitigation site monitoring report: FAP 316 (IL 26), near Orangeville in Stephenson County, 2003. Technical report submitted to the Illinois Department of Transportation, Bureau of Design and Environment.

Reed, P. B., Jr. 1988. National list of plant species that occur in wetlands: Illinois. U.S. Fish and Wildlife Service, National Wetlands Inventory. NERC-88/18.13.

Swink, F., and G. Wilhelm. 1994. Plants of the Chicago region. Indiana Academy of Science, Indianapolis.

Taft, J. B., G. S. Wilhelm, D. M. Ladd, and L. A. Masters. 1997. Floristic quality assessment for vegetation in Illinois - a method for assessing vegetation integrity. Erigenia 15:3-95.

Weaver, K. D. and K. W. Carr. 2001. Orangeville wetland compensation site. Report submitted to the Illinois Department of Transportation, Bureau of Design and Environment, Natural Resources Unit.

Weaver, K. D. and K. W. Carr. 2002. Orangeville wetland compensation site. Report submitted to the Illinois Department of Transportation, Bureau of Design and Environment, Natural Resources Unit.

Weaver, K. D. and K. W. Carr. 2003. Orangeville wetland compensation site. Report submitted to the Illinois Department of Transportation, Bureau of Design and Environment, Natural Resources Unit.

Weaver, K. D. and K. W. Carr. 2004. Orangeville wetland compensation site. Report submitted to the Illinois Department of Transportation, Bureau of Design and Environment, Natural Resources Unit.

APPENDIX A: WETLAND DETERMINATION FORMS

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1A (page 1 of 5)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created marsh is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26.

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X No:
Comment: The site has been recently excavated, affecting soils and hydrology.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Carex lacustris*	OBL	herb
2. *Leersia oryzoides*	OBL	herb
3. *Lemna minor*	OBL	herb
4. *Phalaris arundinacea*	FACW+	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Mapped as Dorchester silt loam, revised to Typic Udorthent.

On county hydric soils list?	Yes:	No:	Undetermined: X
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox Concentrations?	Yes: X	No:	Color: N2.5/0
Redox Depletions?	Yes:	No: X	

Matrix color: 10YR 2/1 over 2.5Y 5/2 (70%) mixed with 10YR 5/6 (30%)
Other indicators: Soils are in level to depressional area. Large (> 5 mm diameter), N2.5/0 colored concretions are also present.
Hydric soils? Yes: X No:
Rationale: There has been a rapid development of prominent hydric features over the last few years. This soil has a low chroma matrix, concretions, and iron masses. This soil also meets the F4 hydric soil indicator from the NRCS.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1A (page 2 of 5)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created marsh is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26.

HYDROLOGY

Inundated: Yes: X (partially) No: Depth of standing water: 0 to 0.25 m (0 to 10 in)
Depth to saturated soil: Saturated at surface
Overview of hydrological flow through the system: This site receives water through precipitation and sheet flow from surrounding higher ground. Water leaves the site via evapotranspiration and stream flow via a culvert at the south end.
Size of Watershed: <100 km^2 (38.6 mi^2)
Other field evidence observed: Barren, cracked soil in some areas

Wetland hydrology: Yes: X No:
Rationale: This site is located in an excavated depression and holds water for a very long time during the growing season. According to a report by ISGS personnel (Weaver and Carr 2004) an estimated 93% of the site was inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion during 2004.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale: This site supports dominant hydrophytic vegetation, hydric soils, and wetland hydrology, and therefore, we determined that the site is a wetland.

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ROUTINE ON-SITE WETLAND DETERMINATION

Site 1A (page 3 of 5)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created marsh is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Agrostis alba	red top	herb	FACW	0
Apocynum cannabinum	dogbane	herb	FAC	2
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster pilosus	hairy aster	herb	FACU+	0
Aster praealtus	willow-leaved aster	herb	FACW	4
Bidens cernua	nodding beggar's ticks	herb	OBL	2
Bidens frondosa	common beggar's ticks	herb	FACW	1
Bidens tripartita	beggar's ticks	herb	OBL	2
Carex sp.	sedge	herb	-----	--
Carex comosa	bristly sedge	herb	OBL	6
Carex cristatella	sedge	herb	FACW+	3
Carex tribuloides	sedge	herb	FACW+	3
Carex vulpinoidea	fox sedge	herb	OBL	3
Cyperus strigosus	straw-colored flatsedge	herb	FACW	0
Eleocharis acicularis	needle spike rush	herb	OBL	3
Eleocharis erythropoda	spike rush	herb	OBL	3
Eupatorium maculatum	spotted Joe Pye weed	herb	OBL	5
Eupatorium perfoliatum	common boneset	herb	FACW+	4
Helenium autumnale	autumn sneezeweed	herb	FACW+	3
Juncus dudleyi	Dudley's rush	herb	FAC	4
Juncus tenuis	path rush	herb	FAC	0
Juncus torreyi	Torrey's rush	herb	FACW	3
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lemna minor	common duckweed	herb	OBL	3
Lindernia dubia	false pimpernel	herb	OBL	5
Lycopus americanus	common water horehound	herb	OBL	3
Lycopus virginicus	bugle weed	herb	OBL	5
Mimulus ringens	monkey flower	herb	OBL	5
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	*

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 1A (page 4 of 5)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created marsh is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26.

SPECIES LIST (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Polygonum hydropiper	common smartweed	herb	OBL	*
Populus deltoides	eastern cottonwood	herb	FAC+	2
Potamogeton sp.	pondweed	herb	OBL	--
Salix amygdaloides	peach-leaved willow	shrub	FACW	4
Salix exigua	sandbar willow	shrub	OBL	1
Salix glaucophylloides	blue-leaf willow	shrub	FACW	8
Salix nigra	black willow	tree	OBL	3
Scutellaria lateriflora	mad-dog skullcap	herb	OBL	4
Solidago canadensis	Canada goldenrod	herb	FACU	1
Taraxacum officinale	common dandelion	herb	FACU	*
Typha angustifolia	narrow-leaved cattail	herb	OBL	*
Typha latifolia	cattail	herb	OBL	1
Ulmus americana	American elm	tree	FACW-	5
Verbena hastata	blue vervain	herb	FACW+	3
Vernonia fasciculata	common ironweed	herb	FACW	5

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \sum C/N = 118/40 = 3.0$
$FQI = \sum C/\sqrt{N} = 118/\sqrt{40} = 18.7$

PLANTED SPECIES

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Alisma plantago-aquatica	broad-leaf water-plantain	herb	OBL	2
Caltha palustris	marsh marigold	herb	OBL	7

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1A (page 5 of 5)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created marsh is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26.

PLANTED SPECIES (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Carex lacustris	river sedge	herb	OBL	6
Eleocharis obtusa	blunt spike rush	herb	OBL	2
Iris shrevei	southern blue flag	herb	OBL	5
Polygonum amphibium	water smartweed	herb	OBL	3
Sagittaria latifolia	arrowhead	herb	OBL	4
Scirpus americanus	chairmaker's rush	herb	OBL	3
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Scirpus cyperinus	wool grass	herb	OBL	5
Scirpus fluviatilis	river bulrush	herb	OBL	3
Scirpus tabernaemontanii	great bulrush	herb	OBL	4
Sparganium eurycarpum	burreed	herb	OBL	5
Spartina pectinata	freshwater cord grass	herb	FACW+	4

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \sum C/N = 175/54 = 3.2$**
$FQI = \sum C/\sqrt{N} = 175/\sqrt{54} = 23.8$**

**These calculations include the complete species list above, as well as the planted species.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 1 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X No:
Comment: The site has been recently excavated, affecting soils and hydrology.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Phalaris arundinacea*	FACW+	herb
2. *Rudbeckia subtomentosa*	FACW	herb
3. *Salix exigua*	OBL	shrub
4. *Salix nigra*	OBL	shrub
5. *Trifolium hybridum*	FAC-	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 80%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Mapped as Dorchester silt loam, revised to Typic Udorthent

On county hydric soils list?	Yes:	No:	Undetermined: X
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox Concentrations?	Yes: X	No:	Color: 7.5YR 3/4 and 5YR 3/4
Redox Depletions?	Yes:	No: X	

Matrix color: 10YR 2/1 over 10YR 5/2
Other indicators: Concretions
Hydric soils? Yes: X No:
Rationale: This is an excavated site where soils were stripped away exposing a lower substratum. This soil has a low chroma matrix and iron concentrations, and therefore, is hydric. This soil does not meet any hydric soil indicator from the NRCS.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 2 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

HYDROLOGY

Inundated: Yes: No: X Depth of standing water: N/A
Depth to saturated soil: > 0.9 m (34 in)
Overview of hydrological flow through the system: This site receives water through precipitation and sheet flow from surrounding higher ground. Water leaves the site via evapotranspiration and sheet flow to Site 1A.
Size of Watershed: <100 km^2 (38.6 mi^2)
Other field evidence observed: None

Wetland hydrology: Yes: X No:
Rationale: This site is in an excavated depression that remains inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion.

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X No:
Rationale: This site supports dominant hydrophytic vegetation, hydric soils, and wetland hydrology, and therefore, we determined that the site is a wetland.

Determined by: Jeff Matthews and Rick Larimore
(vegetation and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 3 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Acer negundo	box elder	herb	FACW-	1
Agrostis alba	red top	herb	FACW	0
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Apocynum cannabinum	dogbane	herb	FAC	2
Aster novae-angliae	New England aster	herb	FACW	4
Aster pilosus	hairy aster	herb	FACU+	0
Aster praealtus	willow-leaved aster	herb	FACW	4
Aster sp.	aster	herb	-----	--
Bidens frondosa	common beggar's ticks	herb	FACW	1
Bidens vulgata	tall beggar's ticks	herb	FACW	0
Bromus japonicus	Japanese brome	herb	FACU	*
Carex sp.	sedge	herb	-----	--
Cirsium arvense	Canada thistle	herb	FACU	*
Cirsium vulgare	bull thistle	herb	FACU-	*
Cyperus strigosus	straw-colored flatsedge	herb	FACW	0
Daucus carota	Queen Anne's lace	herb	UPL	*
Echinochloa muricata	barnyard grass	herb	OBL	0
Epilobium coloratum	cinnamon willow herb	herb	OBL	3
Equisetum arvense	common horsetail	herb	FAC	0
Eupatorium perfoliatum	common boneset	herb	FACW+	4
Juncus dudleyi	Dudley's rush	herb	FAC	4
Lactuca serriola	prickly lettuce	herb	FAC	*
Lemna minor	common duckweed	herb	OBL	3
Lycopus americanus	common water horehound	herb	OBL	3
Melilotus alba	white sweet clover	herb	FACU	*
Oenothera biennis	evening primrose	herb	FACU	1

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 4 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

SPECIES LIST (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Oxalis stricta	yellow wood sorrel	herb	FACU	0
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phalaris arundinacea	reed canary grass	herb	FACW+	*
Phleum pratense	Timothy	herb	FACU	*
Polygonum hydropiper	common smartweed	herb	OBL	*
Polygonum persicaria	spotted lady's thumb	herb	FACW	*
Populus deltoides	eastern cottonwood	shrub	FAC+	2
Potentilla norvegica	rough cinquefoil	herb	FAC	0
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	*
Salix exigua	sandbar willow	shrub	OBL	1
Salix glaucophylloides	blue-leaf willow	shrub	FACW	8
Salix nigra	black willow	shrub	OBL	3
Setaria glauca	pigeon grass	herb	FAC	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Solidago gigantea	late goldenrod	herb	FACW	3
Taraxacum officinale	common dandelion	herb	FACU	*
Trifolium hybridum	alsike clover	herb	FAC-	*
Trifolium repens	white clover	herb	FACU+	*
Ulmus americana	American elm	tree	FACW-	5
Verbena hastata	blue vervain	herb	FACW+	3
Vernonia fasciculata	common ironweed	herb	FACW	5
Vitis riparia	riverbank grape	vine	FACW-	2

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \Sigma C/N = 67/34 = 2.0$
$FQI = \Sigma C/\sqrt{N} = 67/\sqrt{34} = 11.5$

ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 5 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

PLANTED SPECIES

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Andropogon gerardii	big bluestem	herb	FAC-	5
Anemone canadensis	meadow anemone	herb	FACW	4
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster puniceus firmus	shining aster	herb	OBL	5
Betula japonica	birch	sapling	-----	*
Betula nigra	river birch	sapling	FACW	4
Carex lacustris	river sedge	herb	OBL	6
Carex vulpinoidea	fox sedge	herb	OBL	3
Echinacea purpurea	purple coneflower	herb	UPL	6
Eleocharis acicularis	needle spike rush	herb	OBL	3
Eleocharis obtusa	blunt spike rush	herb	OBL	2
Elymus canadensis	Canada wild rye	herb	FAC-	4
Eryngium yuccifolium	rattlesnake master	herb	FAC+	7
Eupatorium maculatum	spotted Joe Pye weed	herb	OBL	5
Glyceria striata	fowl manna grass	herb	OBL	4
Helenium autumnale	autumn sneezeweed	herb	FACW+	3
Iris shrevei	southern blue flag	herb	OBL	5
Juncus torreyi	Torrey's rush	herb	FACW	3
Leersia oryzoides	rice cutgrass	herb	OBL	3
Liatris pycnostachya	button snakeroot	herb	FAC-	6
Lobelia cardinalis	cardinal-flower	herb	OBL	6
Lobelia siphilitica	blue cardinal-flower	herb	FACW+	4
Panicum virgatum	prairie switchgrass	herb	FAC+	4
Physostegia virginiana	false dragonhead	herb	FACW	6
Polygonum amphibium	water smartweed	herb	OBL	3
Populus deltoides	eastern cottonwood	tree	FAC+	2
Potentilla arguta	prairie cinquefoil	herb	FACU-	10
Quercus bicolor	swamp white oak	tree	FACW+	7
Quercus macrocarpa	burr oak	tree	FAC-	5

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ROUTINE ON-SITE WETLAND DETERMINATION
Site 1B (page 6 of 6)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 10 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wet prairie border of created marsh
Legal Description: S/2, SW/4, Sect. 36, T 29 N, R 7 E
Location: This created wetland is located north of the former West St. James Road, west of the Jane Addams bike trail (former Wisconsin and Calumet Railroad right-of-way), and east of the realigned Illinois Route 26. It borders Site 1A, the created marsh.

PLANTED SPECIES (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Ratibida pinnata	drooping coneflower	herb	UPL	4
Rudbeckia hirta	black-eyed Susan	herb	FACU	2
Rudbeckia subtomentosa	fragrant coneflower	herb	FACW	5
Schizachyrium scoparium	little bluestem	herb	FACU-	5
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Scirpus fluviatilis	river bulrush	herb	OBL	3
Scirpus tabernaemontanii	great bulrush	herb	OBL	4
Silphium integrifolium	wholeleaf rosinweed	herb	UPL	5
Silphium perfoliatum	cup plant	herb	FACW-	4
Solidago rigida	rigid goldenrod	herb	FACU-	4
Sorghastrum nutans	Indian grass	herb	FACU+	4
Spartina pectinata	freshwater cord grass	herb	FACW+	4

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \sum C/N = 244/74 = 3.3$**
$FQI = \sum C/\sqrt{N} = 244/\sqrt{74} = 28.4$**

**These calculations include the complete species list above, as well as the planted species.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 1 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

Do normal environmental conditions exist at this site? Yes: X No:
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X No:
Comment: The site has been excavated recently, affecting soils and hydrology.

VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. *Agrostis alba*	FACW	herb
2. *Bidens frondosa*	FACW	herb
3. *Cirsium vulgare*	FACU-	herb
4. *Leersia oryzoides*	OBL	herb
5. *Phalaris arundinacea*	FACW+	herb
6. *Scirpus atrovirens*	OBL	herb
7. *Solidago gigantea*	FACW	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 86%

Hydrophytic vegetation: Yes: X No:
Rationale: More than 50% of the dominants are OBL, FACW, FAC+, or FAC.

SOILS

Series and phase: Mapped as Dorchester silt loam, revised to Typic Udorthent.

On county hydric soils list?	Yes:	No: X	
Is the soil a histosol?	Yes:	No: X	
Histic epipedon present?	Yes:	No: X	
Redox Concentrations?	Yes: X	No:	Color: 10YR 3/4
Redox Depletions?	Yes:	No: X	

Matrix color: 10YR 2/1 over 10YR 2.5/1
Other indicators: None

Hydric soils? Yes: X No:
Rationale: This is an excavated site where soils were stripped away exposing a lower substratum. Since excavation this soil has developed hydric features (low chroma matrix with prominent redox concentrations). Therefore this is a hydric soil. This soil does not meet any of the current hydric soil indicators from the NRCS.

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 2 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

HYDROLOGY

Inundated: Yes: X (partially) No: Depth of standing water: 0 to 0.25 m (0 to 10 in)
Depth to saturated soil: Varies from saturation at surface to 1.0 m (40 in)
Overview of hydrological flow through the system: This site receives water through precipitation, sheet flow from surrounding higher ground, and occasional overflow from Richland Creek and a tributary. Water leaves the site via evapotranspiration and sheet flow into Richland Creek and a tributary.
Size of Watershed: <100 km^2 (38.6 mi^2)
Other field evidence observed: Water-borne sediment deposits on vegetation

Wetland hydrology: Yes: X (in part) No:
Rationale: This site occupies an excavated area along Richland Creek and is occasionally inundated. However, according to a report by ISGS personnel (Weaver and Carr 2004) only 1.50 ha (3.71 ac) of the site is inundated or saturated for a sufficient duration to satisfy the wetland hydrology criterion. In constrast, ISGS personnel estimated in 2001 that 3.28 ha (8.10 ac) satisfied the wetland hydrology criterion (Weaver and Carr 2001).

DETERMINATION AND RATIONALE:

Is the site a wetland? Yes: X (in part) No:
Rationale: Although this site supports hydrophytic vegetation and hydric soils, a large portion of it lacked conclusive evidence of wetland hydrology in 2002, 2003, and 2004. In 2001 a much larger portion of the site satisfied the wetland hydrology criterion. It is unlikely that, during a normal year, the entire site will satisfy the wetland hydrology criterion.

Determined by: Jeff Matthews and Rick Larimore (vegetation and hydrology)
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ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 3 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

SPECIES LIST

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Acalypha rhomboidea	three-seeded mercury	herb	FACU	0
Acer negundo	box elder	shrub	FACW-	1
Acer saccharinum	silver maple	herb	FACW	1
Agrostis alba	red top	herb	FACW	0
Alisma plantago-aquatica	broad-leaf water-plantain	herb	OBL	2
Alopecurus pratensis	meadow foxtail	herb	FACW	*
Ambrosia artemisiifolia	common ragweed	herb	FACU	0
Ambrosia trifida	giant ragweed	herb	FAC+	0
Angelica atropurpurea	angelica	herb	OBL	6
Apocynum cannabinum	dogbane	herb	FAC	2
Apocynum sibiricum	Indian hemp	herb	FAC+	2
Arctium minus	common burdock	herb	UPL	*
Asclepias incarnata	swamp milkweed	herb	OBL	4
Aster lateriflorus	side-flowered aster	herb	FACW-	2
Aster novae-angliae	New England aster	herb	FACW	4
Aster pilosus	hairy aster	herb	FACU+	0
Aster sp.	aster	herb	-----	--
Bidens cernua	nodding beggar's ticks	herb	OBL	2
Bidens frondosa	common beggar's ticks	herb	FACW	1
Bidens tripartita	beggar's ticks	herb	OBL	2
Bidens vulgata	tall beggar's ticks	herb	FACW	0
Brassica kaber	charlock	herb	UPL	0
Bromus inermis	awnless brome grass	herb	UPL	*
Calystegia sepium	American bindweed	herb	FAC	1
Carex sp.	sedge	herb	-----	--
Chenopodium album	lamb's quarters	herb	FAC-	*
Cirsium arvense	Canada thistle	herb	FACU	*
Cirsium vulgare	bull thistle	herb	FACU-	*
Conyza canadensis	horseweed	herb	FAC-	0

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 4 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

SPECIES LIST (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Daucus carota	Queen Anne's lace	herb	UPL	*
Dipsacus sylvestris	common teasel	herb	UPL	*
Echinochloa muricata	barnyard grass	herb	OBL	0
Echinocystis lobata	wild balsam-apple	herb	FACW-	4
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Epilobium coloratum	cinnamon willow herb	herb	OBL	3
Erigeron annuus	annual fleabane	herb	FAC-	1
Eupatorium perfoliatum	common boneset	herb	FACW+	4
Festuca arundinacea	tall fescue	herb	FACU+	*
Fraxinus pennsylvanica	green ash	shrub	FACW	2
Geum canadense	white avens	herb	FAC	2
Glechoma hederacea	ground ivy	herb	FACU	*
Helenium autumnale	autumn sneezeweed	herb	FACW+	3
Helianthus grosseserratus	sawtooth sunflower	herb	FACW-	2
Hordeum jubatum	squirrel-tail	herb	FAC+	*
Impatiens capensis	jewelweed	herb	FACW	2
Juncus dudleyi	Dudley's rush	herb	FAC	4
Lactuca canadensis	Canada lettuce	herb	FACU+	1
Lactuca serriola	prickly lettuce	herb	FAC	*
Lemna minor	common duckweed	herb	OBL	3
Leonurus cardiaca	motherwort	herb	UPL	*
Lobelia siphilitica	blue cardinal-flower	herb	FACW+	4
Lycopus americanus	common water horehound	herb	OBL	3
Melilotus alba	white sweet clover	herb	FACU	*
Mentha arvensis villosa	field mint	herb	FACW	4
Myosoton aquaticum	giant chickweed	herb	FAC+	*
Oenothera biennis	evening primrose	herb	FACU	1
Oxalis stricta	yellow wood sorrel	herb	FACU	0
Pastinaca sativa	parsnip	herb	UPL	*

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION
Site 2 (page 5 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

SPECIES LIST (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Phalaris arundinacea	reed canary grass	herb	FACW+	*
Phleum pratense	Timothy	herb	FACU	*
Pilea pumila	Canada clearweed	herb	FACW	3
Poa pratensis	Kentucky bluegrass	herb	FAC-	*
Polygonum hydropiper	common smartweed	herb	OBL	*
Polygonum lapathifolium	lady's thumb	herb	FACW+	0
Polygonum pensylvanicum	giant smartweed	herb	FACW+	1
Polygonum persicaria	spotted lady's thumb	herb	FACW	*
Polygonum scandens	climbing buckwheat	herb	FAC	2
Polygonum sp.	spotted lady's thumb	herb	-----	--
Populus deltoides	eastern cottonwood	shrub, herb	FAC+	2
Potentilla norvegica	rough cinquefoil	herb	FAC	0
Rumex altissimus	pale dock	herb	FACW-	2
Rumex crispus	curly dock	herb	FAC+	*
Salix amygdaloides	peach-leaved willow	shrub	FACW	4
Salix exigua	sandbar willow	shrub	OBL	1
Salix glaucophylloides	blue-leaf willow	shrub	FACW	8
Salix nigra	black willow	shrub	OBL	3
Sambucus canadensis	common elder	herb	FACW-	2
Scutellaria lateriflora	mad-dog skullcap	herb	OBL	4
Setaria glauca	pigeon grass	herb	FAC	*
Solanum dulcamara	false bittersweet	herb	FAC	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Solidago gigantea	late goldenrod	herb	FACW	3
Sonchus arvensis	field sowthistle	herb	FAC-	*
Taraxacum officinale	common dandelion	herb	FACU	*
Toxicodendron radicans	poison ivy	herb	FAC+	1
Trifolium repens	white clover	herb	FACU+	*
Typha latifolia	cattail	herb	OBL	1

(continued on next page)

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 6 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

SPECIES LIST (continued)

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Ulmus americana	American elm	herb	FACW-	5
Urtica dioica	stinging nettle	herb	FAC+	2
Verbena hastata	blue vervain	herb	FACW+	3
Verbena urticifolia	white vervain	herb	FAC+	3
Vitis riparia	riverbank grape	vine	FACW-	2

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \sum C/N = 130/62 = 2.1$
$FQI = \sum C/\sqrt{N} = 130/\sqrt{62} = 16.5$

ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 7 of 7)

Field Investigators: Matthews, Kurylo, and Larimore
Date: 9 September 2004
Project Name: FAP 316
State: Illinois **County:** Stephenson **Applicant:** IDOT District 2
Site Name: Wetland enhancement
Legal Description: E/2, NW/4, Sect. 1, T 28 N, R 7 E
Location: This wetland enhancement is located south of the former West St. James Road, along the east and west sides of Richland Creek, upstream and downstream from the bridge on relocated Illinois Route 26.

PLANTED SPECIES

Scientific Name	Common Name	Stratum	Wetland indicator status	C†
Calamagrostis canadensis	bluejoint grass	herb	OBL	3
Carex vulpinoidea	fox sedge	herb	OBL	3
Fraxinus pennsylvanica	green ash	tree	FACW	2
Glyceria striata	fowl manna grass	herb	OBL	4
Juncus torreyi	Torrey's rush	herb	FACW	3
Leersia oryzoides	rice cutgrass	herb	OBL	3
Populus deltoides	eastern cottonwood	tree	FAC+	2
Quercus bicolor	swamp white oak	tree	FACW+	7
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Spartina pectinata	freshwater cord grass	herb	FACW+	4

† Coefficient of Conservatism (Taft et al. 1997)
* Non-native species

$mCv = \Sigma C/N = 165/72 = 2.3$**
$FQI = \Sigma C/\sqrt{N} = 165/\sqrt{72} = 19.4$**

**These calculations include the complete species list above, as well as the planted species.

APPENDIX B: HYDROLOGIC INFORMATION

Figure 1: Estimated extent of 2003 wetland hydrology at Site 1 (figure prepared by ISGS, from Weaver and Carr 2004).

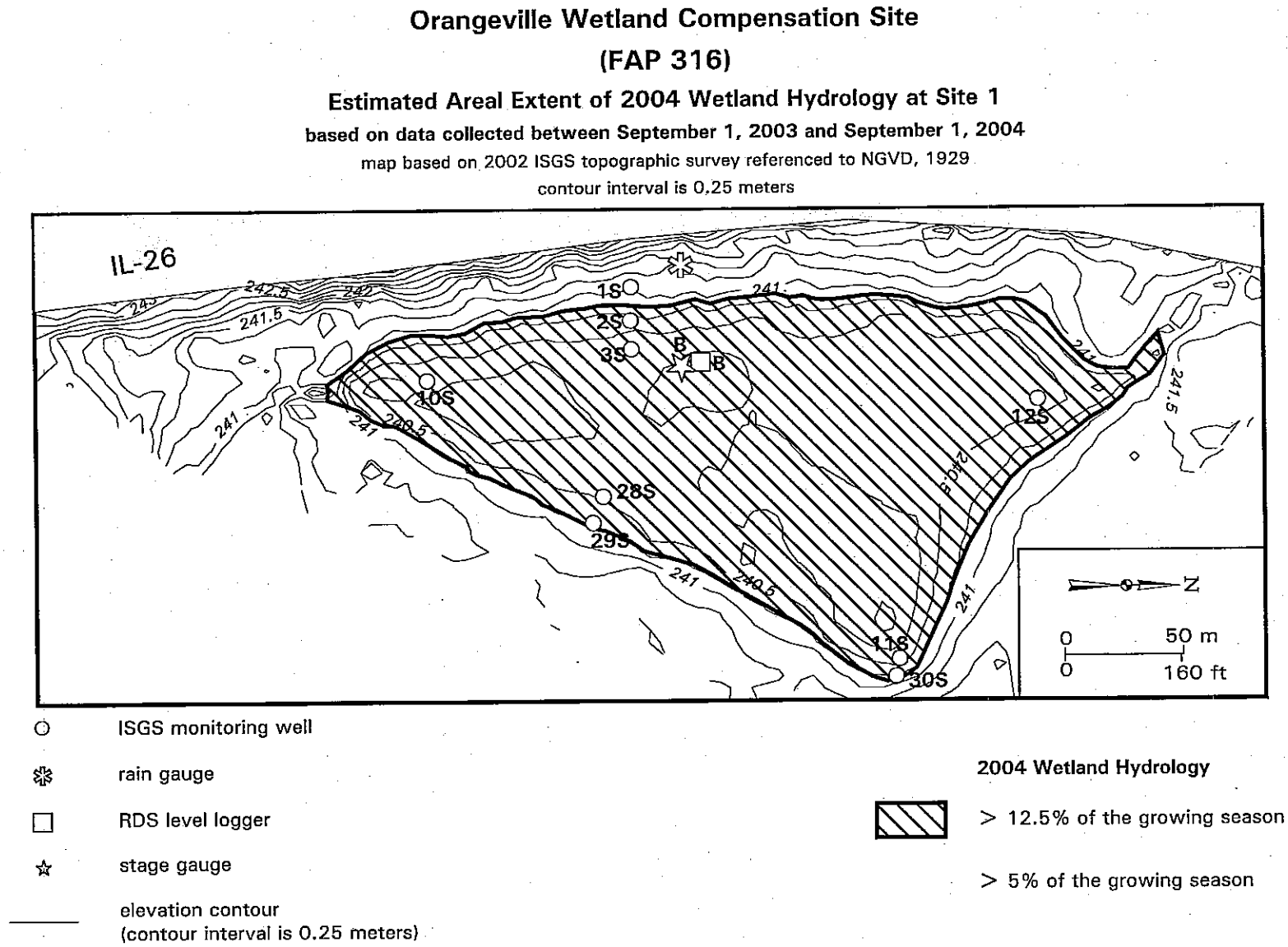
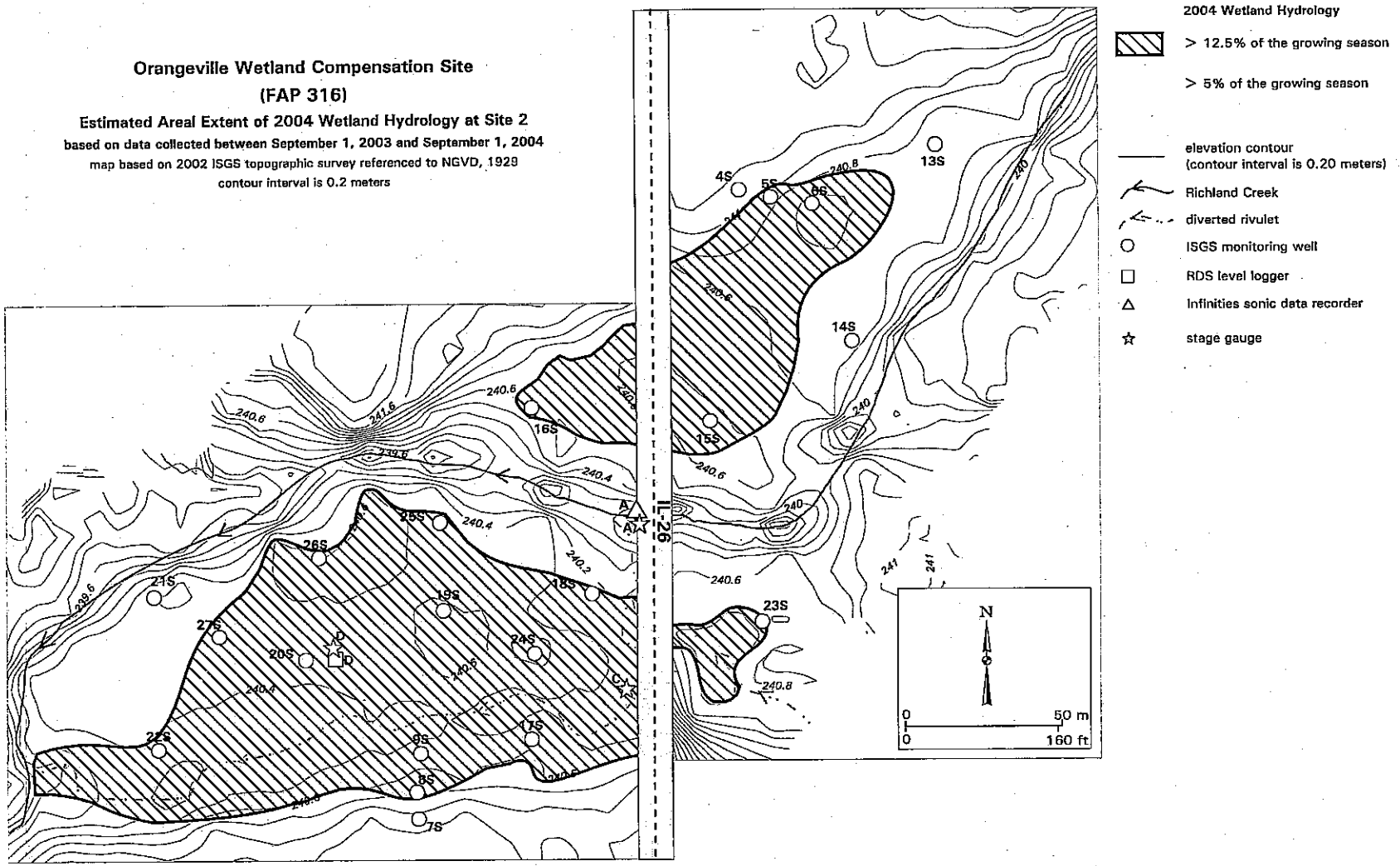


Figure 2: Estimated extent of 2003 wetland hydrology at Site 2 (figure prepared by ISGS, from Weaver and Carr 2004).



APPENDIX C: RESULTS OF QUANTITATIVE VEGETATION SAMPLING

Table 1: Results of 2004 quantitative vegetation sampling at Site 1A (created marsh)

Species	Frequency	Relative frequency	Average cover	Relative cover	IV
Lemna minor	91.4	18.0	22.1	20.5	19.2
Phalaris arundinacea	51.4	10.1	27.4	25.4	17.8
Leersia oryzoides	48.6	9.6	12.6	11.7	10.6
Carex lacustris	28.6	5.6	12.9	12.0	8.8
Alisma plantago-aquatica	45.7	9.0	4.4	4.1	6.5
Eleocharis acicularis	34.3	6.7	4.7	4.4	5.6
Scirpus fluviatilis	22.9	4.5	4.0	3.7	4.1
Polygonum hydropiper	25.7	5.1	0.6	0.6	2.8
Lycopus americanus	17.1	3.4	0.5	0.5	1.9
Scirpus tabernaemontanii	11.4	2.2	1.4	1.3	1.8
Typha angustifolia	8.6	1.7	1.9	1.8	1.7
Salix exigua	8.6	1.7	1.6	1.5	1.6
Penthorum sedoides	11.4	2.2	0.7	0.6	1.4
Scirpus americanus	8.6	1.7	1.3	1.2	1.4
Spartina pectinata	8.6	1.7	1.2	1.2	1.4
Cyperus strigosus	8.6	1.7	0.9	0.9	1.3
Bidens cernua	11.4	2.2	0.3	0.2	1.2
Carex spp.	2.9	0.6	1.8	1.7	1.1
Scirpus cyperinus	2.9	0.6	1.8	1.7	1.1
Juncus tenuis	5.7	1.1	1.2	1.1	1.1
Eleocharis obtusa	8.6	1.7	0.3	0.2	1.0
Typha latifolia	5.7	1.1	0.9	0.8	1.0
Aster praealtus	5.7	1.1	0.5	0.5	0.8
Agrostis alba	2.9	0.6	1.1	1.0	0.8
Juncus dudleyi	2.9	0.6	0.4	0.4	0.5
Scirpus atrovirens	2.9	0.6	0.4	0.4	0.5
Sparganium eurycarpum	2.9	0.6	0.4	0.4	0.5
Aster pilosus	2.9	0.6	0.1	0.1	0.3
Bidens frondosa	2.9	0.6	0.1	0.1	0.3
Bidens tripartita	2.9	0.6	0.1	0.1	0.3
Helenium autumnale	2.9	0.6	0.1	0.1	0.3
Lindernia dubia	2.9	0.6	0.1	0.1	0.3
Scutellaria lateriflora	2.9	0.6	0.1	0.1	0.3
Ulmus americana	2.9	0.6	0.1	0.1	0.3
Acalypha rhomboidea	2.9	0.6	0.0	0.0	0.3
Taraxacum officinale	2.9	0.6	0.0	0.0	0.3
Sum	509	100	108	100	100

Table 2: Results of 2004 quantitative vegetation sampling at Site 1B (wet prairie border)

Species	Frequency	Relative frequency	Average cover	Relative cover	IV
Phalaris arundinacea	100.0	15.7	56.3	44.6	30.2
Salix nigra	25.0	3.9	11.1	8.8	6.3
Trifolium hybridum	37.5	5.9	8.4	6.7	6.3
Rudbeckia subtomentosa	29.2	4.6	8.2	6.5	5.5
Salix exigua	25.0	3.9	5.1	4.1	4.0
Aster novae-angliae	29.2	4.6	1.4	1.1	2.8
Scirpus atrovirens	12.5	2.0	4.3	3.4	2.7
Lycopus americanus	25.0	3.9	1.8	1.4	2.7
Helenium autumnale	16.7	2.6	3.0	2.4	2.5
Taraxacum officinale	25.0	3.9	1.0	0.8	2.4
Aster pilosus	20.8	3.3	1.6	1.3	2.3
Polygonum amphibium	16.7	2.6	1.5	1.2	1.9
Eleocharis acicularis	12.5	2.0	1.9	1.5	1.7
Rudbeckia hirta	12.5	2.0	1.4	1.1	1.5
Solidago rigida	8.3	1.3	2.2	1.7	1.5
Polygonum hydropiper	16.7	2.6	0.4	0.3	1.5
Cirsium arvense	12.5	2.0	0.9	0.7	1.3
Cyperus strigosus	12.5	2.0	0.9	0.7	1.3
Scirpus fluviatilis	8.3	1.3	1.7	1.3	1.3
Eupatorium perfoliatum	8.3	1.3	1.3	1.0	1.1
Juncus torreyi	8.3	1.3	1.3	1.0	1.1
Aster praealtus	12.5	2.0	0.4	0.3	1.1
Carex spp.	12.5	2.0	0.4	0.3	1.1
Eleocharis obtusa	8.3	1.3	0.8	0.6	1.0
Juncus dudleyi	8.3	1.3	0.8	0.6	1.0
Lobelia siphilitica	8.3	1.3	0.8	0.6	1.0
Solidago gigantea	8.3	1.3	0.8	0.6	1.0
Equisetum arvense	4.2	0.7	1.6	1.2	0.9
Echinochloa muricata	8.3	1.3	0.3	0.2	0.8
Glyceria striata	8.3	1.3	0.3	0.2	0.8
Potentilla norvegica	8.3	1.3	0.3	0.2	0.8
Ulmus americana	8.3	1.3	0.3	0.2	0.8
Apocynumcannabinum	4.2	0.7	0.6	0.5	0.6
Carex vulpinoidea	4.2	0.7	0.6	0.5	0.6
Eryngium yuccafolium	4.2	0.7	0.6	0.5	0.6
Salix glaucophylloides	4.2	0.7	0.6	0.5	0.6
Silphium integrifolium	4.2	0.7	0.6	0.5	0.6
Acalypha rhomboidea	4.2	0.7	0.1	0.1	0.4
Ambrosia artemesiifolia	4.2	0.7	0.1	0.1	0.4
Aster puniceus firmus	4.2	0.7	0.1	0.1	0.4
Aster sp.	4.2	0.7	0.1	0.1	0.4
Bidens cernua	4.2	0.7	0.1	0.1	0.4
Bidens frondosa	4.2	0.7	0.1	0.1	0.4
Bromus japonicus	4.2	0.7	0.1	0.1	0.4

Continued on next page

Table 2 (Continued)

Epilbium coloratum	4.2	0.7	0.1	0.1	0.4
Lactuca serriola	4.2	0.7	0.1	0.1	0.4
Leersia oryzoides	4.2	0.7	0.1	0.1	0.4
Oxalis stricta	4.2	0.7	0.1	0.1	0.4
Polyonum.persicaria	4.2	0.7	0.1	0.1	0.4
Silphium perfoliatum	4.2	0.7	0.1	0.1	0.4
Verbena hastata	4.2	0.7	0.1	0.1	0.4
Vitis riparia	4.2	0.7	0.1	0.1	0.4
Alisma plantago-aquatica	4.2	0.7	0.0	0.0	0.3
Lemna minor	4.2	0.7	0.0	0.0	0.3
Penthorum sedoides	4.2	0.7	0.0	0.0	0.3
Sum	642	100	127	100	100

Table 3: Results of 2004 quantitative vegetation sampling at Site 2 (wetland enhancement)

Species	Frequency	Relative frequency	Average cover	Relative cover	IV
Phalaris arundinacea	68.4	13.8	38.0	30.0	21.9
Solidago gigantea	31.6	6.3	10.2	8.1	7.2
Bidens vulgata	31.6	6.3	7.7	6.1	6.2
Leersia oryzoides	26.3	5.3	7.3	5.8	5.5
Impatiens capensis	28.9	5.8	6.1	4.9	5.3
Agrostis alba	18.4	3.7	7.7	6.0	4.9
Aster lateriflorus	18.4	3.7	3.7	2.9	3.3
Scirpus atrovirens	15.8	3.2	4.2	3.3	3.2
Angelica artopurpurea	21.1	4.2	1.3	1.0	2.6
Poa pratensis	7.9	1.6	4.6	3.6	2.6
Carex vulpinoidea	7.9	1.6	4.2	3.3	2.5
Bromus inermis	10.5	2.1	2.5	2.0	2.1
Salix nigra	7.9	1.6	3.0	2.4	2.0
Epilobium coloratum	15.8	3.2	0.8	0.6	1.9
Cirsium vulgare	10.5	2.1	1.9	1.5	1.8
Lycopus americanus	15.8	3.2	0.5	0.4	1.8
Glechoma hederacea	7.9	1.6	2.4	1.9	1.7
Salix exigua	5.3	1.1	2.6	2.1	1.6
Juncus dudleyi	10.5	2.1	1.3	1.0	1.6
Acer negundo	7.9	1.6	1.8	1.4	1.5
Populus deltoides	7.9	1.6	1.5	1.2	1.4
Apocynum cannabinum	7.9	1.6	1.2	0.9	1.3
Taraxacum offininale	10.5	2.1	0.3	0.2	1.2
Solidago canadensis	5.3	1.1	1.4	1.1	1.1
Lactuca serriola	7.9	1.6	0.6	0.4	1.0
Urtica dioica	5.3	1.1	1.1	0.8	0.9
Elymus virginicus	2.6	0.5	1.6	1.3	0.9
Polygonum hydropiper	5.3	1.1	0.8	0.6	0.8
Myosoton aquaticum	5.3	1.1	0.5	0.4	0.7
Potentilla norvegica	5.3	1.1	0.5	0.4	0.7
Spartina pectinata	5.3	1.1	0.5	0.4	0.7
Carex sp.	2.6	0.5	1.0	0.8	0.7
Mentha arvensis	2.6	0.5	1.0	0.8	0.7
Aster sp.	5.3	1.1	0.2	0.1	0.6
Erigeron annuus	5.3	1.1	0.2	0.1	0.6
Polygonum sp.	5.3	1.1	0.1	0.1	0.6
Aster pilosus	2.6	0.5	0.4	0.3	0.4
Brassica kaber	2.6	0.5	0.4	0.3	0.4
Echinochloa muricata	2.6	0.5	0.4	0.3	0.4
Juncus torreyi	2.6	0.5	0.4	0.3	0.4
Polygonum scandens	2.6	0.5	0.4	0.3	0.4
Verbena urticifolia	2.6	0.5	0.4	0.3	0.4
Acer saccharinum	2.6	0.5	0.1	0.1	0.3

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Table 3 (Continued)

Ambrosia artemesiifolia	2.6	0.5	0.1	0.1	0.3
Bidens tripartita	2.6	0.5	0.1	0.1	0.3
Cirsium arvense	2.6	0.5	0.1	0.1	0.3
Conyza canadensis	2.6	0.5	0.1	0.1	0.3
Festuca arundinacea	2.6	0.5	0.1	0.1	0.3
Geum canadense	2.6	0.5	0.1	0.1	0.3
Oxalis stricta	2.6	0.5	0.1	0.1	0.3
Polygonum pensylvanicum	2.6	0.5	0.1	0.1	0.3
Rumex crispus	2.6	0.5	0.1	0.1	0.3
Vitis riparia	2.6	0.5	0.0	0.0	0.3
Sum	497	100	127	100	100

APPENDIX D: PHOTOGRAPHS OF WETLAND MITIGATION SITES

PHOTOGRAPH LEGENDS

Figure 1: View of Site 1 to the north.

Figure 2: View of Site 1 to the south.

Figure 3: View of Site 1 to the west.

Figure 4: View of Site 1 to the east.

Figure 5: View of Site 2 to the northeast from the south end of the bridge over Richland Creek.

Figure 6: View of Site 2 to the southeast from the north end of the bridge over Richland Creek.

Figure 7: View of Site 2 to the northwest from the south end of the bridge over Richland Creek.

Figure 8: View of Site 2 to the southwest from the north end of the bridge over Richland Creek.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8